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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,148	03/24/2004	Masaharu Itaya	50024-027	3704

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McDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER
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MARTIN, ANGELA J

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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08/22/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



<b>Office Action Summary</b>	<b>Application No.</b> 10/807,148	<b>Applicant(s)</b> ITAYA ET AL.	
	<b>Examiner</b> Angela J. Martin	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-9 is/are pending in the application.
- 4a) Of the above claim(s) 10-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |



### **DETAILED ACTION**

This Office Action is responsive to the Amendment filed on May 25, 2007. The Applicant has canceled claim 4 and amended claims 1 and 5. However, Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, this action is made final. Although Applicant amended independent claim 1 by incorporating the limitations of now canceled claim 4, dependent claims are now dependent on a claim with new limitations.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visco et al., U.S. Pat. No. 6,248,481 B1, in view of Shishikura et al., U.S. Pat. No. 4,537,843 or Zhang et al., U.S. Pat. No. 6,312,853 B1.

Visco et al., teach a non-aqueous electrolyte secondary battery comprising a positive electrode, a negative electrode, and a non-aqueous electrolyte, wherein said



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positive electrode includes elemental sulfur, and said negative electrode includes silicon that stores lithium (col. 4, lines 28-40).

Visco et al., do not teach the electrolyte includes a quaternary ammonium salt.

Shishikura et al., teach a secondary battery comprising an electrolyte including a quaternary ammonium salt (abstract; col. 5, lines 4-10). It teaches the salt is a trimethylpropylammonium, trimethylhexylammonium (claim 5).

Zhang et al., teach a secondary battery comprising an electrolyte including a quaternary ammonium salt (abstract; col. 4, lines 33-60). It teaches the salt is a trimethylpropylammonium, trimethylhexylammonium (col. 4, lines 41-67; col. 9, lines 12-64).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert the teachings of Shishikura et al., or the teachings of Zhang et al., into the teachings of Visco et al., because the quaternary ammonium salt has a high solubility in an organic solvent and provides a secondary battery which has a high energy density, a high charging-discharging efficiency, a long cycle life, a good voltage levelness and a low self-discharge rate (Shishikura et al). Additionally, the melting point of the quaternary ammonium salt would fall in the range of not higher than 60 degrees C.



3. Claims 1, 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Visco et al., U.S. Pat. No. 6,248,481 B1, in view of Ikeda et al., EP 1231651 A1.

Rejection of claims 1, 6- 9 drawn to a non-aqueous electrolyte secondary battery.

Visco et al., teach a non-aqueous electrolyte secondary battery comprising a positive electrode, a negative electrode, and a non-aqueous electrolyte, wherein said positive electrode includes elemental sulfur, and said negative electrode includes silicon that stores lithium (col. 4, lines 28-40). Visco et al., teach wherein the non-aqueous electrolyte secondary battery wherein said non-aqueous electrolyte further includes at least one type of solvent selected from the group consisting of cyclic ether, chain ether, and fluorinated carbonate (col. 4, lines 1-19). The non-aqueous electrolyte secondary battery according to claim 6, wherein said cyclic ether includes at least one type selected from the group consisting of 1,3-dioxolane and tetrahydrofuran; said chain ether preferably includes 1,2-dimethoxyethane; and said fluorinated carbonate includes at least one type selected from the group consisting of trifluoropropylene carbonate and tetrafluoropropylene carbonate (col. 4, lines 1-19).

Ikeda et al., teach the non-aqueous electrolyte secondary battery according to claim 1, wherein the non-aqueous electrolyte secondary battery according to claim 1, wherein said silicon is an amorphous silicon thin film or a microcrystalline silicon thin film (0021). The non-aqueous electrolyte secondary battery according to claim 1, wherein a conductive agent is added to said positive electrode (0055).

Thus, one of ordinary skill in the art at the time the invention was made



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would insert the teachings of Ikeda et al., into the teachings of Visco et al., because Ikeda et al., teaches a list of solvents well known in the art of lithium batteries.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM

  
PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER